PATENT ABSTRACTS OF JAPAN

(11)Publication number : 10-011242
(43)Date of publication of application : 16.01.1998

(51)Int.Cl. G06F 3/12
B41J 29/38

(21)Application number : 08-185304
(22)Date of filing : 27.06.1996

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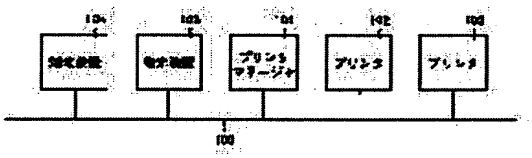
(54) PRINTING SYSTEM

(57)Abstract:
PROBLEM TO BE SOLVED: To print the remaining part with another substitutive printer without wasting a part the printing of which has been finished until then when a fault is generation a printer under executing a printing job.
SOLUTION: This printing system is provided with a printer manager 101 which detects the generation of the fault in the printer under executing the printing job to select the substitutive printer representing the printer based a previously fixed countermeasure for the time of generating on a fault and transmits the printing job and information on pages the printer generating the fault already finishes printing to the substitutive printer, and plural printers 102 and 103 which receive the printing job and page information from the printer manager 101 when being selected as the representing printer and execute the following part of the already executed printing job. The printer manager 101 and the plural printers 102 and 103 are connected through a network 100.



LEGAL STATUS

[Date of request for examination]	11.07.2001
[Date of sending the examiner's decision of rejection]	09.03.2004
[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]	
[Date of final disposal for application]	
[Patent number]	
[Date of registration]	
[Number of appeal against examiner's decision of rejection]	
[Date of requesting appeal against examiner's decision of rejection]	
[Date of extinction of right]	

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CLAIMS

[Claim(s)]

[Claim 1] While choosing the deputy printer which replaces said printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits the page information to which the printer which said print job and said failure generated already ended printing to said deputy printer, The print system characterized by having the printer which performs a continuation of the print job which received said print job and said page information from said printer management tool, and was already performed based on said page information when chosen as said deputy printer.

[Claim 2] The print system characterized by choosing failure countermeasures beforehand from said two or more failure countermeasures before said printer management tool has memorized two or more failure countermeasures and a failure occurs to a printer while performing a print job in a print system according to claim 1.

[Claim 3] The print system characterized by notifying the abolition instruction of a print job to the printer concerned, and for said printer receiving advice of said abolition instruction, and discarding said print job in a print system according to claim 1 when a failure occurs to said printer while said printer management tool is performing printing.

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention chooses the deputy printer which replaces the printer which the failure generated when a failure occurs in a detail more about a print system at a printer while performing printing, and it is related with the print system which can continue printing without human being's inclusion.

[0002]

[Description of the Prior Art] Although countermeasures when the failure which cannot continue printing to a printer while performing printing occurs are indicated, there is JP,5-181621,A "a print control unit" as an example. This print control unit notifies by

telephone the operator who is not present in near of an error situation, when a failure occurs to a printer at the time of printing in a network.

[0003] Moreover, there is JP,6-187111,A "a print system" as other examples. This print system is a thing of the ability to make a print output from other deputy printers defined beforehand, when the printer planned as an output destination change is unusable.

[0004]

[Problem(s) to be Solved by the Invention] However, in some which were indicated by JP,5-181621,A, if through [human being canceled the failure of a printer, and made printing resume by the printer or printing by the printer was given up, and all documents needed to be reprinted by another printer and] human being after all, there was a problem that printing could not be resumed.

[0005] Moreover, in some which were indicated by JP,6-187111,A, since it is the method which reperforms printing by another printer when a failure occurs to a printer while performing printing, there is a problem that all the outputs to have completed printing by the first printer will become futility. Moreover, the approach of switching a print job, for example, the timing which switches a print job, is being fixed to another printer, and there was a problem that there was no room for a user to choose timing etc. as arbitration.

[0006] Therefore, it sets it as the 1st object having no inclusion of human being and to enable termination of a print job of this invention by not making useless a part to have completed printing by then, but printing the remainder by another deputy printer, when it is made in view of the above and a failure occurs to a printer while performing a print job.

[0007] Moreover, it sets it as the 2nd object to make the approach of starting a deputy printer selectable to arbitration.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned object, the print system concerning claim 1 of this invention While choosing the deputy printer which replaces said printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits the page information to which the printer which said print job and said failure generated already ended printing to said deputy printer, When chosen as said deputy printer, said print job and said page information are received from said printer management tool, and it has the printer which performs a continuation of the already performed print job based

on said page information.

[0009] Moreover, in the print system according to claim 1, said printer management tool has memorized two or more failure countermeasures, and the print system concerning claim 2 of this invention chooses failure countermeasures beforehand from said two or more failure countermeasures, before a failure occurs to a printer while performing a print job.

[0010] Furthermore, when a failure generates the print system concerning claim 3 of this invention to said printer while said printer management tool is performing printing in a print system according to claim 1, the abolition instruction of a print job is notified to the printer concerned, and said printer receives advice of said abolition instruction, and discards said print job.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of the print system operation concerning this invention is explained to a detail, referring to a drawing.

[0012] Drawing 1 is the block diagram showing the outline configuration of the print system concerning the gestalt of operation of this invention. While the print system shown in drawing 1 chooses the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was defined beforehand With the printer manager 101 as a printer management tool of this invention who transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer Two or more printers 102,103 which perform a continuation of the print job which received a print job and page information from the printer manager 101, and was already performed based on page information when chosen as a deputy printer, Through the network 100, it connects, respectively and a preparation, the printer manager 101, and two or more printers 102,103 are constituted.

[0013] Moreover, on the network 100, the terminal unit 104,105 equipped with applications, such as a word processor database, is connected, and the document by which printing processing is carried out by the print system of this invention is drawn up with these terminal units 104,105. In addition, the number of connection of a terminal unit and a printer is not limited to the number shown in drawing 1 .

[0014] Two or more printers 102,103 which should be managed are beforehand registered into the printer manager 101. The printer manager 101 communicated with the registered printer 102,103, and always grasps in what kind of condition each printer 102,103 is now. And the printer manager 101 performs failure evasion processing mentioned later, when the failure which cannot continue printing to the printer under

print occurs, while receiving a print job from each terminal unit 104,105 and distributing this to a suitable printer.

[0015] The printer 102,103 is managed by one printer manager 101, and is registered by the printer manager 101 at the time of the setup of a printer. After registration, a printer 102,103 notifies that the power source was supplied to the printer manager 101, whenever a power source is switched on, and it can offer print service now. In addition, a printer 102,103 receives setting out of paper, a feeding-and-discarding paper tray, both sides, copy number of copies, etc. from the printer manager 101, and prints the content of printing (print data) defined by PDL data according to the setting out to media, such as paper. Moreover, when PDL data are given, a printing termination page can be specified for a printing initiation page to a printer 102,103. PDL data are Page about the content of printing (an alphabetic character, image) here. Description It is the thing of the data which Language defined.

[0016] A user creates a print job with a terminal unit 104,105, and hands the printer manager 101 a print job. Moreover, a user can receive examination of the progress situation of printing, selection of the countermeasures at the time of a failure, and service of advice of printing termination through the printer manager 101.

[0017] In addition, the above-mentioned print job is the combination of the PDL data mentioned above and print job setting out. It is the thing of the meeting of the data with which print job setting out defines selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, selection of the countermeasures at the time of failure generating, etc. here. Selection of a deputy printer has the format which chooses a printer clearly, and the format which describes the algorithm which chooses deputy equipment from the printer group of arbitration.

[0018] Below, actuation of the print system concerning the gestalt of operation of this invention is divided into [actuation of a printer manager] and [actuation of a printer], and it explains at a detail.

[0019] [Actuation of printer manager] drawing 2 is a flow chart which shows the printer manager's 101 main routine in the print system concerning the gestalt of operation of this invention. A user draws up a document in a terminal unit 104,105 using applications, such as a word processor and a database. And when printing the document, the printer manager 101 is started and print job setting out is performed. Here, actuation of the printer manager 101 is explained in order of (the usual processing of a printer manager) and (processing of the printer manager at the time of failure

generating).

[0020] (The usual processing of a printer manager) The printer manager 101 displays the menu of print job setting out on a user's terminal unit 104,105 first (S201). A user can set up the countermeasures at the time of selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, and failure generating on this menu.

[0021] in selection of a printer, all the printers that the printer manager 101 manages display on a menu -- having -- from this inside -- explicit -- a specific printer -- one set -- or two or more sets can be chosen. When only one printer is chosen, only the printer is used for printing. When two or more printers are chosen, the optimal printer is chosen by the printer manager 101 in the printer which can realize the conditions specified by print job setting out. Moreover, it is also possible not to choose a printer clearly, it is all the printers that the printer manager 101 manages in this case, and the printer optimal out of the printer which can realize the conditions specified by print job setting out is chosen.

[0022] Moreover, the printer manager 101 has memorized some kinds of countermeasures, such as "it does not carry out", "it changing to a deputy printer promptly", and "it changing to a deputy printer, if a failure is not solved after failure generating and within X part", as countermeasures at the time of failure generating, and displays these on a menu. A user can choose the countermeasures at the time of failure generating according to the significance of a print job.

[0023] About paper, a feeding-and-discarding paper tray, double-sided printing, and setting out of copy number of copies, since the list of the sum of the function of two or more available printers is displayed on a menu, a required function is chosen out of this. For example, when three sets of printers are available, two sets presuppose that double-sided printing is possible and double-sided printing of the one set cannot be carried out (when the specific printer is not chosen or three sets are chosen clearly). In this case, "double-sided printing" can be set up with a print job setting-out menu. However, when "double-sided printing" is chosen, the printer which cannot carry out double-sided printing is excepted from the object for selection.

[0024] One or more deputy printers are chosen from the printers which fulfill the conditions specified by print job setting out. Unless a failure occurs in activation of the print job in the printer chosen first, the printer manager 101 does not transmit a print job to a deputy printer.

[0025] In addition, in explanation of the gestalt of operation of this invention, there

shall be a printing demand, the printer 102 should be chosen from the terminal unit 104 in setting out of a print job as a printer which performs printing first, and the printer 103 should be chosen as a deputy printer.

[0026] The printer manager 101 will receive the document changed into PDL data from the terminal unit 104, if print job setting out is completed in step S201 (S202). The printer manager 101 combines print job setting out and PDL data, and manages with charge till termination of a print job.

[0027] The printer manager 101 chooses the printer which performs a print job based on print job setting out (S203). As mentioned above, one set of the printer which suits the conditions specified by one set of a specific printer and print job setting out chosen by the user is chosen. Here, a printer 102 is chosen.

[0028] The printer manager 101 judges whether the selected printer 102 can perform a print job (S204). If a printer 102 is in the condition that a print job can be performed, printer job setting out will be transmitted to a printer 102, and printer job setting out will be made to perform to a printer 102 (S207). With printer job setting out, setting out of selection of a printer and selection of a deputy printer is removed from print job setting out performed at step S201 here. That is, printer job setting out is the set of selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, and setting out of copy number of copies.

[0029] On the other hand, when the selected printer 102 is in the condition that a print job cannot be performed, it judges whether a printer 102 is busy (S205). When busy, it waits to return to step S204 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S206), it returns to step S204, and processing is continued.

[0030] Then, the printer manager 101 receives the report of printer job setting-out termination from a printer 102 (S208), and transmits PDL data to a printer 102 (S209).

[0031] And the printer manager 101 waits for the advice of printing termination from a printer 102 (S210). When advice of printing termination is received, while deleting the managed PDL data (S211), advice of job termination is transmitted to a terminal unit 104 (S212), and a job is ended.

[0032] Drawing 3 is a flow chart which shows the printer manager's 101 event processing routine. A printer manager receives advice (event) of the information about the present situation from a printer to the completion of printing, after 101 transmits PDL data to a printer at step S209 of drawing 2 .

[0033] The printer manager 101 will judge whether it is that (failure generating report event) the event indicates it to be that the failure occurred to a printer, if an event is

received (S301). If it is not generating of a failure, the event will judge whether it is what shows the progress situation of the print job of a printer (progress situation report event) (S302).

[0034] Although a progress situation report event is explained to a detail in case it explains actuation of a printer, processing of PDL data is started, and whenever it delivers paper to one sheet of paper, it is transmitted from a printer, and Paige's number defined by PDL data, copy number of copies specified by printer job setting out are indicated. In addition, at the time of double-sided printing, the information on a table or a flesh side is also simultaneously indicated for printing having been completed.

[0035] The printer manager 101 displays this progress situation on the terminal screen of a terminal unit 104 while always grasping Paige and the copy number of sheets in which the progress situation sent from the printer 102 was recorded, and the printer 102 ended printing (S304). For example, when it is displayed as "printing termination number-of-sheets:X and; copy termination number-of-sheets:Y" and all the number of sheets and copy number of copies of a print job are known, anticipation end time is also displayed.

[0036] Then, the printer manager 101 receives advice of the completion of printing from a printer 102 (S305), notifies completion of printing to a terminal unit 104 (S306), and ends event processing.

[0037] In addition, in step S302 of drawing 3 , when the event which received is not in a print job progress situation, other event processing is performed (S303). Since other event processing does not have direct relevance, it abbreviates the explanation to this invention here.

[0038] (Processing of the printer manager at the time of failure generating) Next, actuation when a failure occurs to a printer 102 is explained. In addition, with a failure, a paper jam, a form piece, etc. shall include all the cases where a printer cannot continue printing.

[0039] In step S301 of drawing 3 , the printer manager 101 detects that the failure occurred to the printer from the event transmitted from the printer. Then, the printer manager 101 checks the countermeasures at the time of failure generating chosen by print job setting out. For example, when "it will change to a deputy printer promptly and will continue, if a failure occurs" is chosen as countermeasures at the time of failure generating, it progresses to step S308 and determines to start failure evasion processing. Moreover, for example, when "it will change to a deputy printer if a failure is not solved after failure generating and within X part" is chosen as countermeasures at the time of failure generating, a failure evasion timer is started at step S307, and it waits for

predetermined time amount and initiation of failure evasion processing.

[0040] The printer manager 101 after opting for initiation of failure evasion processing in step S308 notifies a job abolition instruction to the printer 102 which the failure generated (S309), and the remaining data are made not to be printed after a failure is canceled.

[0041] A continuation of return and failure evasion processing is explained to drawing 2. In step S213, the printer manager 101 determines a deputy printer based on print job setting out. Here, a printer 103 is used as a deputy printer.

[0042] The printer manager 101 judges whether the determined deputy printer 103 can perform a print job (S214). If the deputy printer 103 is in the condition that a print job can be performed, printer job setting out will be transmitted to the deputy printer 103, and printer job setting out will be performed (S217). With this printer job setting out, the flag which chooses "PDL data skip mode" as setting out sent to the printer which the failure generated, and the printer which the failure generated add the progress situation report event transmitted at the end. In addition, "PDL data skip mode" is a mode of operation of the printer mentioned later, and the printer which the failure generated is the mode in which it is made not to perform Paige's already printed printing processing with reference to the progress status-report event transmitted at the end. Moreover, it is displayed on the display screen of a terminal unit 104 that the deputy printer 103 was chosen.

[0043] On the other hand, when the determined deputy printer 103 is in the condition that a print job cannot be performed, in step S214, it judges whether the deputy printer 103 is busy (S215). When busy, it waits to return to step S214 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S216), it returns to step S214, and processing is continued.

[0044] Then, the printer manager 101 receives the report of the completion of printer job setting out from the deputy printer 103 (S218), and transmits PDL data to a deputy printer (S209). In addition, since the processing after PDL data transfer is as the term mentioned above (the usual processing of a printer manager) having explained, it omits the explanation here.

[0045] [actuation of a printer] -- continuing -- actuation of a printer -- (the usual processing) -- and (processing at the time of failure generating) (actuation of a deputy printer) it divides and explains. Drawing 4 is a flow chart which shows the main routine of a printer in the print system concerning the gestalt of operation of this invention.

[0046] (The usual processing) The printer 102 chosen by print job setting out receives printer job setting out transmitted by the printer manager 101, and changes own

setting out (S401).

[0047] A printer 102 judges whether the flag in "PDL data skip mode" exists in printer job setting out (S402). Here, it progresses to step S404 as that in which the flag in "PDL data skip mode" does not exist, and the report of printer job setting-out termination is transmitted to the printer manager 101.

[0048] And the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406), and it prints on the recording paper (S408). Detection of that paper was delivered to the printed detail paper transmits a progress situation report event to the printer manager 101 (S410). (S409) That is, a progress status-report event is outputted to the printer manager 101, whenever it delivers paper to one sheet of paper.

[0049] Here, a progress situation report event is explained to a detail. A progress situation report event is written in the format of Pn-Cn-Sn-Fn-Tn. Pn is Paige's number defined by PDL data here, and Cn is a copy number-of-copies number. Sn is the number of the paper printed and consecutive numbers are attached to the sequence which a printer operates regardless of the page number or copy number of copies at paper. Fn is the number of Men of paper, for example, 1 displays [0] a flesh side with a table. Tn is the number of a paper output tray.

[0050] PDL data define the data to print in an order from eye 1 Paige. That is, the data for n Paige are located in a line with P1, P2, P3, ..., Pn, and these Paige is printed by Papers S1, S2, S3, ..., Sn in this sequence. In addition, in double-sided printing, P1 is printed by the table of S1 and P2 is printed by the flesh side of S1, respectively. Therefore, it writes concretely P1-C1-S1-F1-T1, P2-C1-S2-F1-T1, P3-C1-S3-F1-T1, ..., Pn-C1-Sn-F1-T1 [a progress situation report event].

[0051] moreover, the case where it is the case (a sorter is used automatically) where copy number of copies of the m section is specified as print job setting out, and is one side printing -- P1-1 and P -- 1-2, P1-3, and ... Pn-m, P2-1, and P -- page data called 2-2, P2-3, ..., Pn-m are printed by the paper of S1, S2, S3, ..., Snxm. Therefore, P1-C1-S1-F1-T1, P1-C2-S2-F1-T2, a progress status-report event It is written as ....., P1-Cm-Sm-F1-Tm, P2-C1-S(m+1)-F1-T1, P2-C(m+2)-S1-F1-T2, ..., P1-Cm-S(2m)-F1-Tm.

[0052] the case of double-sided printing -- P -- 1-1 andP2-1 -- S1 and P -- 1-2 andP2-2S2 and ... the page data of P(n-1)-m, Pn-m (when the number of n is even), or Pn-1 (when the number of n is odd) are printed by Snm. Therefore, it writes P1-C1-S1-F1-T1, P2-C1-S1-F2-T1, P1-C2-S2-F1-T2, P2-C2-S2-F2-T2, and ..... [a progress situation report event]

[0053] "That is, whenever [to which as for a printer, one sheet of paper is delivered] The c-th copy of the data of eye p Paige of PDL is printed on the s-th paper. It reports that paper was delivered to the paper output tray of No. t", or "having printed the c-th copy of the data of eye p of PDL Paige, and eye p+1 Paige on the s-th paper, and having delivered paper to the paper output tray of No. t" to the printer manager 101. However, the notation approach of the above-mentioned progress situation report event is an example to the last, and the notation approach changes according to the mechanism of a printer, for example, the approach of double-sided printing.

[0054] A printer 102 judges whether PDL data are termination, after notifying a progress situation report event (S411). When PDL data are not completed, processing returned and mentioned above to step S405 is performed. On the other hand, when PDL data are completed, advice of job termination is transmitted to the printer manager 101 (S412), and a print job is ended.

[0055] (Processing at the time of failure generating) Next, actuation of the printer at the time of failure generating is explained as what the paper jam generated to the printer. If it detects that the paper jam generated the printer 102, a failure generating report event will be transmitted and it will notify that the failure occurred to the printer manager 101 (S413).

[0056] Then, when a failure is canceled, it progresses to step S408, and printing is continued (S414). On the other hand, when a failure is not canceled, it waits for the print job abolition instruction from the printer manager 101 (S415). When a print job abolition instruction is received, a printer 102 notifies the printer manager 101 of the purport which discarded the print job (S416), and ends a job while it cancels the print job interrupted according to the failure.

[0057] (Actuation of a deputy printer) As mentioned above, when a failure occurs to the printer 102 while performing a print job, the printer manager 101 determines a deputy printer according to print job setting out set up beforehand. The printer 103 determined as the deputy printer receives printer job setting out transmitted by the printer manager 101, and changes own setting out (S401). In addition, in addition to setting out sent to the printer 102 which the failure generated, the progress situation report event which the flag which chooses "PDL data skip mode", and the printer 102 which the failure generated have transmitted at the end is added and made this printer job setting out.

[0058] The deputy printer's 103 detection of the flag which chooses "PDL data skip mode" from printer job setting out sets up the skip page number according to the progress situation report event set as printer job setting out (S403). (S402) That is, it is

made not to perform printing processing which is Paige whom the printer 102 which the failure generated already printed by setting up the skip page number. Then, the deputy printer 103 notifies the purport which setting out completed to the printer manager 101 (S404).

[0059] Then, the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406). Then, the skip page number set up with Paige who created the page image is compared (S407). For example, since printing is completed by the printer 102 which the failure already generated, the page image which the created page image created when the skip page number was set up with 3 Paige by eye 1 of PDL data Paige is not printed to the recording paper, but progresses to step S410, and performs a progress situation report.

[0060] On the other hand, since the page image created when the skip page number was set up with 3 Paige by eye 4 of PDL data Paige is not printed yet, after the page image created, for example prints to the recording paper (S408) and delivers paper to the recording paper (S409), it performs a progress situation report (S410). In actuation of the deputy printer 103, about actuation (the usual processing) (processing at the time of failure generating) of others including actuation when a failure occurs, since it is the same as that of what explained, the explanation is omitted.

[0061] In addition, when the printer 102 and the deputy printer 103 which the failure generated are the same model, since the deputy printer 103 can perform the same processing as the printer 102 which the failure generated, it can perform selection of a paper output tray, printing processing of a table and a flesh side, etc. satisfactory.

[0062] When it is the case where it is the model from which the printer 102 which the failure generated, and the deputy printer 103 differ on the other hand and copy number of copies is set as plurality by double-sided printing as print job setting out, the sequence printed by the printer may differ. In this case, the deputy printer 103 can avoid that several intermediate pages are not printed, even if the print stations of a printer differ by performing processing in which "the PDL data for an even-numbered page with which the printer which the failure generated ended processing thoroughly" is not printed not printing "the paper in which the printer which the failure generated ended printing."

[0063] Thus, according to the print system concerning the gestalt of operation of this invention, when a failure occurs to the printer 102 while performing a print job, termination of a print job can be enabled [having no inclusion of human being and] by not making useless a part to have completed printing by then, but printing the

remainder by another deputy printer 103. Moreover, since the countermeasures at the time of failure generating can be chosen from some kinds, such as "it does not carry out", "it changing to a deputy printer promptly", and "changing to a deputy printer if a failure is not solved after failure generating and within X part", they can choose the countermeasures at the time of failure generating according to the significance of a print job, and are dramatically convenient.

[0064]

[Effect of the Invention] As explained above, according to the print system (claim 1) concerning this invention While choosing the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer, Since it has the printer which performs a continuation of the print job which received a print job and page information from the printer management tool, and was already performed based on page information when chosen as a deputy printer, A print job can be completed by the deputy printer, without making useless a part to already have completed printing by the printer which the failure generated.

[0065] Moreover, according to the print system (claim 2) concerning this invention, in a print system according to claim 1, the printer management tool has memorized two or more failure countermeasures, before a failure occurs to a printer while performing a print job, it writes to choose failure countermeasures beforehand from two or more failure countermeasures, and it becomes possible to change the policy of failure evasion into arbitration.

[0066] Furthermore, according to the print system (claim 3) concerning this invention, it sets to a print system according to claim 1. When a failure occurs to a printer while a printer management tool is performing printing, notify the abolition instruction of a print job to the printer concerned, and a printer receives advice of an abolition instruction and writes to discard a print job. In spite of having made the deputy printer continue the remaining print jobs, after the failure of the printer which the failure generated is canceled, it can prevent that the same data are printed.

TECHNICAL FIELD

[The technical field to which invention belongs] This invention chooses the deputy printer which replaces the printer which the failure generated when a failure occurs in a detail more about a print system at a printer while performing printing, and it is related with the print system which can continue printing without human being's inclusion.

PRIOR ART

[Description of the Prior Art] Although countermeasures when the failure which cannot continue printing to a printer while performing printing occurs are indicated, there is JP,5-181621,A "a print control unit" as an example. This print control unit notifies by telephone the operator who is not present in near of an error situation, when a failure occurs to a printer at the time of printing in a network.

[0003] Moreover, there is JP,6-187111,A "a print system" as other examples. This print system is a thing of the ability to make a print output from other deputy printers defined beforehand, when the printer planned as an output destination change is unusable.

EFFECT OF THE INVENTION

[Effect of the Invention] As explained above, according to the print system (claim 1) concerning this invention While choosing the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer, Since it has the printer which performs a continuation of the print job which received a print job and page information from the printer management tool, and was already performed based on page information when chosen as a deputy printer, A print job can be completed by the deputy printer, without making useless a part to already have completed printing by the printer which the failure generated.

[0065] Moreover, according to the print system (claim 2) concerning this invention, in a print system according to claim 1, the printer management tool has memorized two or more failure countermeasures, before a failure occurs to a printer while performing a print job, it writes to choose failure countermeasures beforehand from two or more

failure countermeasures, and it becomes possible to change the policy of failure evasion into arbitration.

[0066] Furthermore, according to the print system (claim 3) concerning this invention, it sets to a print system according to claim 1. When a failure occurs to a printer while a printer management tool is performing printing, notify the abolition instruction of a print job to the printer concerned, and a printer receives advice of an abolition instruction and writes to discard a print job. In spite of having made the deputy printer continue the remaining print jobs, after the failure of the printer which the failure generated is canceled, it can prevent that the same data are printed.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in some which were indicated by JP,5-181621,A, if through [human being canceled the failure of a printer, and made printing resume by the printer or printing by the printer was given up, and all documents needed to be reprinted by another printer and] human being after all, there was a problem that printing could not be resumed.

[0005] Moreover, in some which were indicated by JP,6-187111,A, since it is the method which reperforms printing by another printer when a failure occurs to a printer while performing printing, there is a problem that all the outputs to have completed printing by the first printer will become futility. Moreover, the approach of switching a print job, for example, the timing which switches a print job, is being fixed to another printer, and there was a problem that there was no room for a user to choose timing etc. as arbitration.

[0006] Therefore, it sets it as the 1st object having no inclusion of human being and to enable termination of a print job of this invention by not making useless a part to have completed printing by then, but printing the remainder by another deputy printer, when it is made in view of the above and a failure occurs to a printer while performing a print job.

[0007] Moreover, it sets it as the 2nd object to make the approach of starting a deputy printer selectable to arbitration.

MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, the print system concerning claim 1 of this invention While choosing the deputy printer which replaces said printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was beforehand set to it The printer management tool which transmits the page information to which the printer which said print job and said failure generated already ended printing to said deputy printer, When chosen as said deputy printer, said print job and said page information are received from said printer management tool, and it has the printer which performs a continuation of the already performed print job based on said page information.

[0009] Moreover, in the print system according to claim 1, said printer management tool has memorized two or more failure countermeasures, and the print system concerning claim 2 of this invention chooses failure countermeasures beforehand from said two or more failure countermeasures, before a failure occurs to a printer while performing a print job.

[0010] Furthermore, when a failure generates the print system concerning claim 3 of this invention to said printer while said printer management tool is performing printing in a print system according to claim 1, the abolition instruction of a print job is notified to the printer concerned, and said printer receives advice of said abolition instruction, and discards said print job.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of the print system operation concerning this invention is explained to a detail, referring to a drawing.

[0012] Drawing 1 is the block diagram showing the outline configuration of the print system concerning the gestalt of operation of this invention. While the print system shown in drawing 1 chooses the deputy printer which replaces a printer based on the countermeasures at the time of failure generating which detected that the failure occurred to the printer while performing a print job, and was defined beforehand With the printer manager 101 as a printer management tool of this invention who transmits a print job and the page information to which the printer which the failure generated already ended printing to a deputy printer Two or more printers 102,103 which perform a continuation of the print job which received a print job and page information from the printer manager 101, and was already performed based on page information when chosen as a deputy printer, Through the network 100, it connects, respectively and a preparation, the printer manager 101, and two or more printers 102,103 are constituted.

[0013] Moreover, on the network 100, the terminal unit 104,105 equipped with applications, such as a word processor database, is connected, and the document by which printing processing is carried out by the print system of this invention is drawn up with these terminal units 104,105. In addition, the number of connection of a terminal unit and a printer is not limited to the number shown in drawing 1 .

[0014] Two or more printers 102,103 which should be managed are beforehand registered into the printer manager 101. The printer manager 101 communicated with the registered printer 102,103, and always grasps in what kind of condition each printer 102,103 is now. And the printer manager 101 performs failure evasion processing mentioned later, when the failure which cannot continue printing to the printer under print occurs, while receiving a print job from each terminal unit 104,105 and distributing this to a suitable printer.

[0015] The printer 102,103 is managed by one printer manager 101, and is registered by the printer manager 101 at the time of the setup of a printer. After registration, a printer 102,103 notifies that the power source was supplied to the printer manager 101, whenever a power source is switched on, and it can offer print service now. In addition, a printer 102,103 receives setting out of paper, a feeding-and-discarding paper tray, both sides, copy number of copies, etc. from the printer manager 101, and prints the content of printing (print data) defined by PDL data according to the setting out to media, such as paper. Moreover, when PDL data are given, a printing termination page can be specified for a printing initiation page to a printer 102,103. PDL data are Page about the content of printing (an alphabetic character, image) here. Description It is the thing of the data which Language defined.

[0016] A user creates a print job with a terminal unit 104,105, and hands the printer manager 101 a print job. Moreover, a user can receive examination of the progress situation of printing, selection of the countermeasures at the time of a failure, and service of advice of printing termination through the printer manager 101.

[0017] In addition, the above-mentioned print job is the combination of the PDL data mentioned above and print job setting out. It is the thing of the meeting of the data with which print job setting out defines selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, selection of the countermeasures at the time of failure generating, etc. here. Selection of a deputy printer has the format which chooses a printer clearly, and the format which describes the algorithm which chooses deputy equipment from the printer group of arbitration.

[0018] Below, actuation of the print system concerning the gestalt of operation of this invention is divided into [actuation of a printer manager] and [actuation of a printer], and it explains at a detail.

[0019] [Actuation of printer manager] drawing 2 is a flow chart which shows the printer manager's 101 main routine in the print system concerning the gestalt of operation of this invention. A user draws up a document in a terminal unit 104,105 using applications, such as a word processor and a database. And when printing the document, the printer manager 101 is started and print job setting out is performed. Here, actuation of the printer manager 101 is explained in order of (the usual processing of a printer manager) and (processing of the printer manager at the time of failure generating).

[0020] (The usual processing of a printer manager) The printer manager 101 displays the menu of print job setting out on a user's terminal unit 104,105 first (S201). A user can set up the countermeasures at the time of selection of a printer, selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, setting out of copy number of copies, selection of the deputy printer at the time of failure generating, and failure generating on this menu.

[0021] in selection of a printer, all the printers that the printer manager 101 manages display on a menu -- having -- from this inside -- explicit -- a specific printer -- one set -- or two or more sets can be chosen. When only one printer is chosen, only the printer is used for printing. When two or more printers are chosen, the optimal printer is chosen by the printer manager 101 in the printer which can realize the conditions specified by print job setting out. Moreover, it is also possible not to choose a printer clearly, it is all the printers that the printer manager 101 manages in this case, and the printer optimal out of the printer which can realize the conditions specified by print job setting out is chosen.

[0022] Moreover, the printer manager 101 has memorized some kinds of countermeasures, such as "it does not carry out", "it changing to a deputy printer promptly", and "it changing to a deputy printer, if a failure is not solved after failure generating and within X part", as countermeasures at the time of failure generating, and displays these on a menu. A user can choose the countermeasures at the time of failure generating according to the significance of a print job.

[0023] About paper, a feeding-and-discarding paper tray, double-sided printing, and setting out of copy number of copies, since the list of the sum of the function of two or more available printers is displayed on a menu, a required function is chosen out of this. For example, when three sets of printers are available, two sets presuppose that

double-sided printing is possible and double-sided printing of the one set cannot be carried out (when the specific printer is not chosen or three sets are chosen clearly). In this case, "double-sided printing" can be set up with a print job setting-out menu. However, when "double-sided printing" is chosen, the printer which cannot carry out double-sided printing is excepted from the object for selection.

[0024] One or more deputy printers are chosen from the printers which fulfill the conditions specified by print job setting out. Unless a failure occurs in activation of the print job in the printer chosen first, the printer manager 101 does not transmit a print job to a deputy printer.

[0025] In addition, in explanation of the gestalt of operation of this invention, there shall be a printing demand, the printer 102 should be chosen from the terminal unit 104 in setting out of a print job as a printer which performs printing first, and the printer 103 should be chosen as a deputy printer.

[0026] The printer manager 101 will receive the document changed into PDL data from the terminal unit 104, if print job setting out is completed in step S201 (S202). The printer manager 101 combines print job setting out and PDL data, and manages with charge till termination of a print job.

[0027] The printer manager 101 chooses the printer which performs a print job based on print job setting out (S203). As mentioned above, one set of the printer which suits the conditions specified by one set of a specific printer and print job setting out chosen by the user is chosen. Here, a printer 102 is chosen.

[0028] The printer manager 101 judges whether the selected printer 102 can perform a print job (S204). If a printer 102 is in the condition that a print job can be performed, printer job setting out will be transmitted to a printer 102, and printer job setting out will be made to perform to a printer 102 (S207). With printer job setting out, setting out of selection of a printer and selection of a deputy printer is removed from print job setting out performed at step S201 here. That is, printer job setting out is the set of selection of paper or a feeding-and-discarding paper tray, setting out of double-sided printing, and setting out of copy number of copies.

[0029] On the other hand, when the selected printer 102 is in the condition that a print job cannot be performed, it judges whether a printer 102 is busy (S205). When busy, it waits to return to step S204 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S206), it returns to step S204, and processing is continued.

[0030] Then, the printer manager 101 receives the report of printer job setting-out termination from a printer 102 (S208), and transmits PDL data to a printer 102 (S209).

[0031] And the printer manager 101 waits for the advice of printing termination from a printer 102 (S210). When advice of printing termination is received, while deleting the managed PDL data (S211), advice of job termination is transmitted to a terminal unit 104 (S212), and a job is ended.

[0032] Drawing 3 is a flow chart which shows the printer manager's 101 event processing routine. A printer manager receives advice (event) of the information about the present situation from a printer to the completion of printing, after 101 transmits PDL data to a printer at step S209 of drawing 2 .

[0033] The printer manager 101 will judge whether it is that (failure generating report event) the event indicates it to be that the failure occurred to a printer, if an event is received (S301). If it is not generating of a failure, the event will judge whether it is what shows the progress situation of the print job of a printer (progress situation report event) (S302).

[0034] Although a progress situation report event is explained to a detail in case it explains actuation of a printer, processing of PDL data is started, and whenever it delivers paper to one sheet of paper, it is transmitted from a printer, and Paige's number defined by PDL data, copy number of copies specified by printer job setting out are indicated. In addition, at the time of double-sided printing, the information on a table or a flesh side is also simultaneously indicated for printing having been completed.

[0035] The printer manager 101 displays this progress situation on the terminal screen of a terminal unit 104 while always grasping Paige and the copy number of sheets in which the progress situation sent from the printer 102 was recorded, and the printer 102 ended printing (S304). For example, when it is displayed as "printing termination number-of-sheets:X and; copy termination number-of-sheets:Y" and all the number of sheets and copy number of copies of a print job are known, anticipation end time is also displayed.

[0036] Then, the printer manager 101 receives advice of the completion of printing from a printer 102 (S305), notifies completion of printing to a terminal unit 104 (S306), and ends event processing.

[0037] In addition, in step S302 of drawing 3 , when the event which received is not in a print job progress situation, other event processing is performed (S303). Since other event processing does not have direct relevance, it abbreviates the explanation to this invention here.

[0038] (Processing of the printer manager at the time of failure generating) Next, actuation when a failure occurs to a printer 102 is explained. In addition, with a failure, a paper jam, a form piece, etc. shall include all the cases where a printer cannot

continue printing.

[0039] In step S301 of drawing 3 , the printer manager 101 detects that the failure occurred to the printer from the event transmitted from the printer. Then, the printer manager 101 checks the countermeasures at the time of failure generating chosen by print job setting out. For example, when "it will change to a deputy printer promptly and will continue, if a failure occurs" is chosen as countermeasures at the time of failure generating, it progresses to step S308 and determines to start failure evasion processing. Moreover, for example, when "it will change to a deputy printer if a failure is not solved after failure generating and within X part" is chosen as countermeasures at the time of failure generating, a failure evasion timer is started at step S307, and it waits for predetermined time amount and initiation of failure evasion processing.

[0040] The printer manager 101 after opting for initiation of failure evasion processing in step S308 notifies a job abolition instruction to the printer 102 which the failure generated (S309), and the remaining data are made not to be printed after a failure is canceled.

[0041] A continuation of return and failure evasion processing is explained to drawing 2 . In step S213, the printer manager 101 determines a deputy printer based on print job setting out. Here, a printer 103 is used as a deputy printer.

[0042] The printer manager 101 judges whether the determined deputy printer 103 can perform a print job (S214). If the deputy printer 103 is in the condition that a print job can be performed, printer job setting out will be transmitted to the deputy printer 103, and printer job setting out will be performed (S217). With this printer job setting out, the flag which chooses "PDL data skip mode" as setting out sent to the printer which the failure generated, and the printer which the failure generated add the progress situation report event transmitted at the end. In addition, "PDL data skip mode" is a mode of operation of the printer mentioned later, and the printer which the failure generated is the mode in which it is made not to perform Paige's already printed printing processing with reference to the progress status-report event transmitted at the end. Moreover, it is displayed on the display screen of a terminal unit 104 that the deputy printer 103 was chosen.

[0043] On the other hand, when the determined deputy printer 103 is in the condition that a print job cannot be performed, in step S214, it judges whether the deputy printer 103 is busy (S215). When busy, it waits to return to step S214 and to cancel a busy condition. It is not busy, printer another when a print job cannot be performed is chosen for a certain reason (S216), it returns to step S214, and processing is continued.

[0044] Then, the printer manager 101 receives the report of the completion of printer job

setting out from the deputy printer 103 (S218), and transmits PDL data to a deputy printer (S209). In addition, since the processing after PDL data transfer is as the term mentioned above (the usual processing of a printer manager) having explained, it omits the explanation here.

[0045] [actuation of a printer] -- continuing -- actuation of a printer -- (the usual processing) -- and (processing at the time of failure generating) (actuation of a deputy printer) it divides and explains. Drawing 4 is a flow chart which shows the main routine of a printer in the print system concerning the gestalt of operation of this invention.

[0046] (The usual processing) The printer 102 chosen by print job setting out receives printer job setting out transmitted by the printer manager 101, and changes own setting out (S401).

[0047] A printer 102 judges whether the flag in "PDL data skip mode" exists in printer job setting out (S402). Here, it progresses to step S404 as that in which the flag in "PDL data skip mode" does not exist, and the report of printer job setting-out termination is transmitted to the printer manager 101.

[0048] And the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406), and it prints on the recording paper (S408). Detection of that paper was delivered to the printed detail paper transmits a progress situation report event to the printer manager 101 (S410). (S409) That is, a progress status-report event is outputted to the printer manager 101, whenever it delivers paper to one sheet of paper.

[0049] Here, a progress situation report event is explained to a detail. A progress situation report event is written in the format of Pn-Cn-Sn-Fn-Tn. Pn is Paige's number defined by PDL data here, and Cn is a copy number-of-copies number. Sn is the number of the paper printed and consecutive numbers are attached to the sequence which a printer operates regardless of the page number or copy number of copies at paper. Fn is the number of Men of paper, for example, 1 displays [0] a flesh side with a table. Tn is the number of a paper output tray.

[0050] PDL data define the data to print in an order from eye 1 Paige. That is, the data for n Paige are located in a line with P1, P2, P3, ..., Pn, and these Paige is printed by Papers S1, S2, S3, ..., Sn in this sequence. In addition, in double-sided printing, P1 is printed by the table of S1 and P2 is printed by the flesh side of S1, respectively. Therefore, it writes concretely P1-C1-S1-F1-T1, P2-C1-S2-F1-T1, P3-C1-S3-F1-T1, ..., Pn-C1-Sn-F1-T1 [a progress situation report event].

[0051] moreover, the case where it is the case (a sorter is used automatically) where copy number of copies of the m section is specified as print job setting out, and is one

side printing -- P1-1 and P -- 1-2, P1-3, and ... Pn-m, P2-1, and P -- page data called 2-2, P2-3, ..., Pn-m are printed by the paper of S1, S2, S3, ..., Snxm. Therefore, P1-C1-S1-F1-T1, P1-C2-S2-F1-T2, a progress status-report event It is written as ....., P1-Cm-Sm-F1-Tm, P2-C1-S(m+1)-F1-T1, P2-C(m+2)-S1-F1-T2, ..., P1-Cm-S(2m)-F1-Tm.

[0052] the case of double-sided printing -- P -- 1-1 andP2-1 -- S1 and P -- 1-2 andP2-2S2 and ... the page data of P(n-1)-m, Pn-m (when the number of n is even), or Pn-1 (when the number of n is odd) are printed by Snm. Therefore, it writes P1-C1-S1-F1-T1, P2-C1-S1-F2-T1, P1-C2-S2-F1-T2, P2-C2-S2-F2-T2, and ..... [a progress situation report event]

[0053] "That is, whenever [to which as for a printer, one sheet of paper is delivered] The c-th copy of the data of eye p Paige of PDL is printed on the s-th paper. It reports that paper was delivered to the paper output tray of No. t", or "having printed the c-th copy of the data of eye p of PDL Paige, and eye p+1 Paige on the s-th paper, and having delivered paper to the paper output tray of No. t" to the printer manager 101. However, the notation approach of the above-mentioned progress situation report event is an example to the last, and the notation approach changes according to the mechanism of a printer, for example, the approach of double-sided printing.

[0054] A printer 102 judges whether PDL data are termination, after notifying a progress situation report event (S411). When PDL data are not completed, processing returned and mentioned above to step S405 is performed. On the other hand, when PDL data are completed, advice of job termination is transmitted to the printer manager 101 (S412), and a print job is ended.

[0055] (Processing at the time of failure generating) Next, actuation of the printer at the time of failure generating is explained as what the paper jam generated to the printer. If it detects that the paper jam generated the printer 102, a failure generating report event will be transmitted and it will notify that the failure occurred to the printer manager 101 (S413).

[0056] Then, when a failure is canceled, it progresses to step S408, and printing is continued (S414). On the other hand, when a failure is not canceled, it waits for the print job abolition instruction from the printer manager 101 (S415). When a print job abolition instruction is received, a printer 102 notifies the printer manager 101 of the purport which discarded the print job (S416), and ends a job while it cancels the print job interrupted according to the failure.

[0057] (Actuation of a deputy printer) As mentioned above, when a failure occurs to the printer 102 while performing a print job, the printer manager 101 determines a deputy

printer according to print job setting out set up beforehand. The printer 103 determined as the deputy printer receives printer job setting out transmitted by the printer manager 101, and changes own setting out (S401). In addition, in addition to setting out sent to the printer 102 which the failure generated, the progress situation report event which the flag which chooses "PDL data skip mode", and the printer 102 which the failure generated have transmitted at the end is added and made this printer job setting out.

[0058] The deputy printer's 103 detection of the flag which chooses "PDL data skip mode" from printer job setting out sets up the skip page number according to the progress situation report event set as printer job setting out (S403). (S402) That is, it is made not to perform printing processing which is Paige whom the printer 102 which the failure generated already printed by setting up the skip page number. Then, the deputy printer 103 notifies the purport which setting out completed to the printer manager 101 (S404).

[0059] Then, the PDL data transmitted by the printer manager 101 are received, and PDL data are processed for every Paige (S405). First, a page image is created based on PDL data (S406). Then, the skip page number set up with Paige who created the page image is compared (S407). For example, since printing is completed by the printer 102 which the failure already generated, the page image which the created page image created when the skip page number was set up with 3 Paige by eye 1 of PDL data Paige is not printed to the recording paper, but progresses to step S410, and performs a progress situation report.

[0060] On the other hand, since the page image created when the skip page number was set up with 3 Paige by eye 4 of PDL data Paige is not printed yet, after the page image created, for example prints to the recording paper (S408) and delivers paper to the recording paper (S409), it performs a progress situation report (S410). In actuation of the deputy printer 103, about actuation (the usual processing) (processing at the time of failure generating) of others including actuation when a failure occurs, since it is the same as that of what explained, the explanation is omitted.

[0061] In addition, when the printer 102 and the deputy printer 103 which the failure generated are the same model, since the deputy printer 103 can perform the same processing as the printer 102 which the failure generated, it can perform selection of a paper output tray, printing processing of a table and a flesh side, etc. satisfactory.

[0062] When it is the case where it is the model from which the printer 102 which the failure generated, and the deputy printer 103 differ on the other hand and copy number of copies is set as plurality by double-sided printing as print job setting out, the

sequence printed by the printer may differ. In this case, the deputy printer 103 can avoid that several intermediate pages are not printed, even if the print stations of a printer differ by performing processing in which "the PDL data for an even-numbered page with which the printer which the failure generated ended processing thoroughly" is not printed not printing "the paper in which the printer which the failure generated ended printing."

[0063] Thus, according to the print system concerning the gestalt of operation of this invention, when a failure occurs to the printer 102 while performing a print job, termination of a print job can be enabled [having no inclusion of human being and] by not making useless a part to have completed printing by then, but printing the remainder by another deputy printer 103. Moreover, since the countermeasures at the time of failure generating can be chosen from some kinds, such as "it does not carry out", "it changing to a deputy printer promptly", and "changing to a deputy printer if a failure is not solved after failure generating and within X part", they can choose the countermeasures at the time of failure generating according to the significance of a print job, and are dramatically convenient.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the outline configuration of the print system concerning the gestalt of operation of this invention.

[Drawing 2] In the print system concerning the gestalt of operation of this invention, it is the flow chart which shows a printer manager's main routine.

[Drawing 3] In the print system concerning the gestalt of operation of this invention, it is the flow chart which shows a printer manager's event processing routine.

[Drawing 4] In the print system concerning the gestalt of operation of this invention, it is the flow chart which shows the main routine of a printer.

[Description of Notations]

100 Network

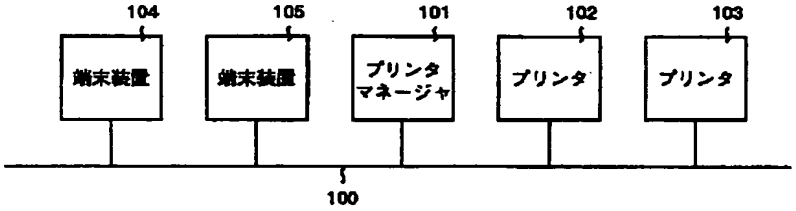
101 Printer Manager

102,103 Printer

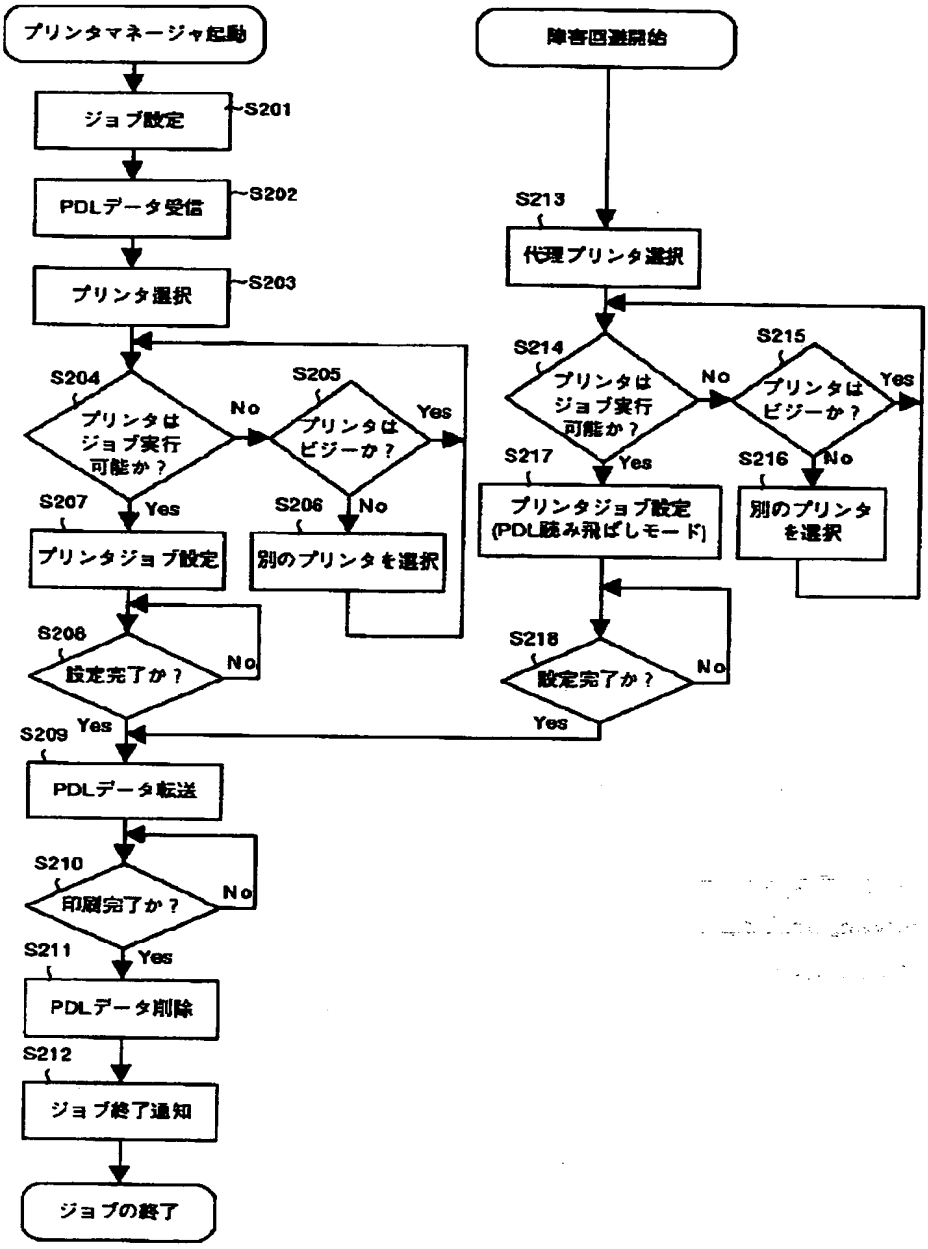
104,105 Terminal unit

DRAWINGS

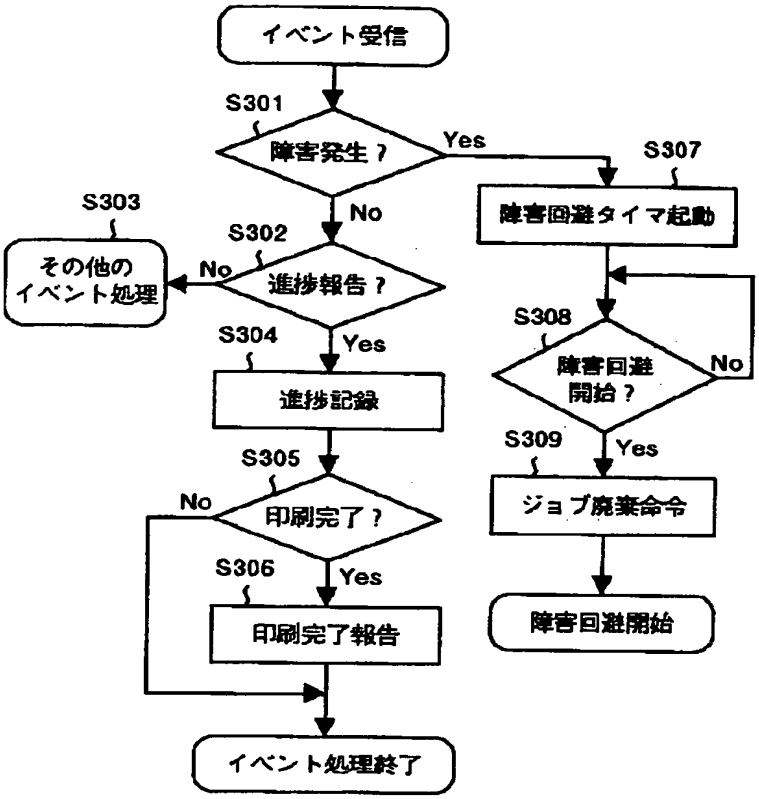
[Drawing 1]



[Drawing 2]


プリンタマネージャ起動
ジョブ設定
S201
PDLデータ受信
S202
プリンタ選択
S203
S204
プリンタは
ジョブ実行
可能か？
No
S205
プリンタは
ビジーか？
Yes
S207
Yes
S206
No
プリンタジョブ設定
別のプリンタを選択
S208
設定完了か？
No
Yes
S209
PDLデータ転送
S210
印刷完了か？
No
S211
Yes
PDLデータ削除
S212
ジョブ終了通知
ジョブの終了
障害回避開始
S213
代理プリンタ選択
S214
プリンタは
ジョブ実行
可能か？
No
S215
プリンタは
ビジーか？
Yes
S217
Yes
S216
No
プリンタジョブ設定
(PDL読み飛ばしモード)
別のプリンタ
を選択
S218
設定完了か？
No
Yes

[Drawing 3]


イベント受信
S301
障害発生？
Yes
S307
障害回避タイマ起動
No
S303
その他の
イベント処理
S302
No
進捗報告？
S308
障害回避
開始？
No
S304
Yes
進捗記録
S309
Yes
S305
ジョブ廃棄命令
No
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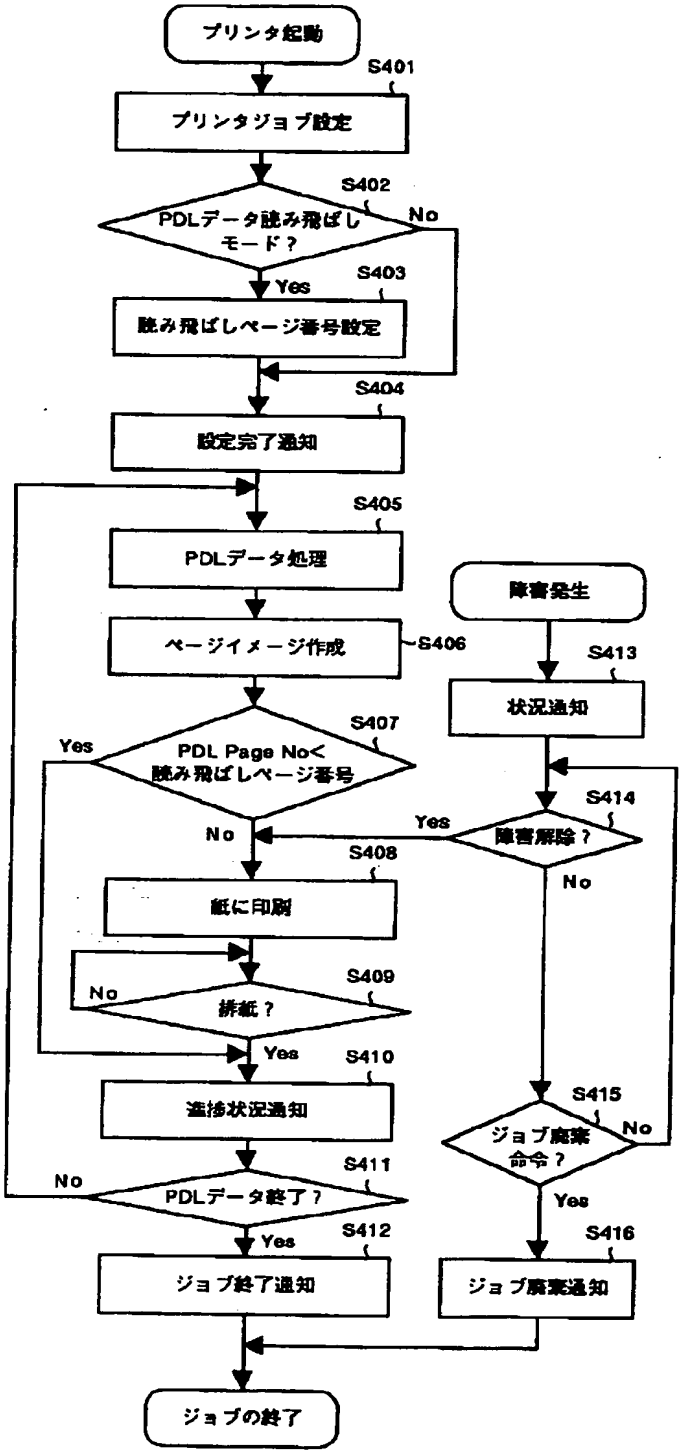
S306
Yes
印刷完了報告
障害回避開始
イベント処理終了

[Drawing 4]


プリンタ起動
S401
プリンタジョブ設定
S402
PDLデータ読み飛ばしモード？
No
Yes
S403
読み飛ばしページ番号設定
S404
設定完了通知
S405
PDLデータ処理
S406
ページイメージ作成
S407
PDL Page No<読み飛ばしページ番号
Yes
No
S408
紙に印刷
S409
No
排紙？
Yes
S410
進捗状況通知
S411
No
PDLデータ終了？
Yes
S412
ジョブ終了通知
ジョブの終了
障害発生
S413
状況通知
S414
Yes
障害解除？
No
S415
ジョブ廃棄命令？
No
Yes
S416
ジョブ廃棄通知

* NOTICES *

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1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.**** shows the word which can not be translated.

3.In the drawings, any words are not translated.

(19)日本国特許庁（ＪＰ）　(12)公開特許公報（Ａ）　(11)特許出願公開番号

特開平10－11242

(43)公開日　平成10年(1998)１月16日

(51)Int.Cl.[6]	識別記号	庁内整理番号	ＦＩ		技術表示箇所
Ｇ０６Ｆ　3/12			Ｇ０６Ｆ　3/12	Ｋ	
				Ｄ	
Ｂ４１Ｊ　29/38			Ｂ４１Ｊ　29/38	Ｚ	

審査請求　未請求　請求項の数３　ＦＤ　（全 10 頁）

(21)出願番号　特願平8－185304

(22)出願日　平成８年(1996)６月27日

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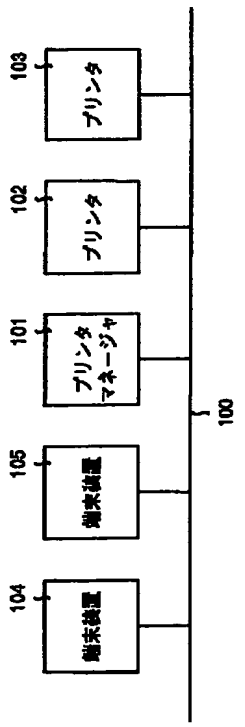
(54)【発明の名称】　プリントシステム

(57)【要約】

【課題】　印刷ジョブを実行中のプリンタに障害が発生した場合，それまでに印刷が終了した分を無駄にせず，残りを別の代理プリンタで印刷する。

【解決手段】　本発明に係るプリントシステムは，印刷ジョブを実行中のプリンタに障害が発生したことを検知し，予め定めた障害発生時の対応策に基づいてプリンタに代わる代理プリンタを選択すると共に，代理プリンタに対して印刷ジョブと障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタマネージャ１０１と，代理プリンタとして選択された場合，プリンタマネージャ１０１から印刷ジョブとページ情報とを受信し，ページ情報に基づいて，既に実行された印刷ジョブの続きを実行する複数のプリンタ１０２，１０３と，を備え，プリンタマネージャ１０１と複数のプリンタ１０２，１０３とはネットワーク１００を介してそれぞれ接続されて構成されている。



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【特許請求の範囲】

【請求項１】　印刷ジョブを実行中のプリンタに障害が発生したことを検知し，予め定めた障害発生時の対応策に基づいて前記プリンタに代わる代理プリンタを選択すると共に，前記代理プリンタに対して前記印刷ジョブと前記障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタ管理手段と，前記代理プリンタとして選択された場合，前記プリンタ管理手段から前記印刷ジョブと前記ページ情報とを受信し，前記ページ情報に基づいて，既に実行された印刷ジョブの続きを実行するプリンタと，を備えることを特徴とするプリントシステム。

【請求項２】　請求項１記載のプリントシステムにおいて，前記プリンタ管理手段が，複数の障害対応策を記憶しており，印刷ジョブを実行中のプリンタに障害が発生する前に前記複数の障害対応策の中から障害対応策を予め選択しておくことを特徴とするプリントシステム。

【請求項３】　請求項１記載のプリントシステムにおいて，前記プリンタ管理手段が，印刷を実行中の前記プリンタに障害が発生した場合，当該プリンタに対して印刷ジョブの廃棄命令を通知し，前記プリンタが，前記廃棄命令の通知を受信し，前記印刷ジョブを廃棄することを特徴とするプリントシステム。

【発明の詳細な説明】

【０００１】

【発明が属する技術分野】本発明はプリントシステムに関し，より詳細には，印刷を実行中のプリンタに障害が発生した場合，障害が発生したプリンタに代わる代理プリンタを選択し，人間の介在なしに印刷を続行することが可能なプリントシステムに関する。

【０００２】

【従来の技術】印刷を実行中のプリンタに印刷が続行不可能な障害が発生した場合の対応策を開示するものの例として，特開平５－１８１６２１号公報『印刷制御装置』がある。この印刷制御装置は，ネットワークでの印刷時においてプリンタに障害が発生した場合，近くにいないオペレータに電話でエラー状態を通知するというものである。

【０００３】また，他の例として特開平６－１８７１１１号公報『プリントシステム』がある。このプリントシステムは，出力先として予定されていたプリンタが使用不可能である場合，予め定められた他の代理プリンタから印刷物を出力させることができるというものである。

【０００４】

【発明が解決しようとする課題】しかしながら，特開平５－１８１６２１号公報に開示されたものでは，人間がプリンタの障害を解除し，そのプリンタで印刷を再開させるか，そのプリンタでの印刷をあきらめて別のプリンタで文書を全て印刷し直す必要があり，結局人間を介さなければ印刷を再開することができないという問題があった。

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【０００５】また，特開平６－１８７１１１号公報に開示されたものでは，印刷を実行中のプリンタに障害が発生した場合に別のプリンタで印刷を実行し直す方式であるため，最初のプリンタで印刷が終了した分の出力が全て無駄になってしまうという問題がある。また，別のプリンタに印刷ジョブを切り換える方法，例えば印刷ジョブを切り換えるタイミング等が固定されており，ユーザが任意にタイミング等を選択する余地がないという問題があった。

【０００６】したがって，本発明は上記に鑑みてなされたものであって，印刷ジョブを実行中のプリンタに障害が発生した場合，それまでに印刷が終了した分を無駄にせず，残りを別の代理プリンタで印刷することによって，人間の介在なしで印刷ジョブを終了可能にすることを第１の目的とする。

【０００７】また，代理プリンタを起動する方法を任意に選択可能にすることを第２の目的とする。

【０００８】

【課題を解決するための手段】上記目的を達成するため，本発明の請求項１に係るプリントシステムは，印刷ジョブを実行中のプリンタに障害が発生したことを検知し，予め定めた障害発生時の対応策に基づいて前記プリンタに代わる代理プリンタを選択すると共に，前記代理プリンタに対して前記印刷ジョブと前記障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタ管理手段と，前記代理プリンタとして選択された場合，前記プリンタ管理手段から前記印刷ジョブと前記ページ情報とを受信し，前記ページ情報に基づいて，既に実行された印刷ジョブの続きを実行するプリンタとを備えるものである。

【０００９】また，本発明の請求項２に係るプリントシステムは，請求項１記載のプリントシステムにおいて，前記プリンタ管理手段が，複数の障害対応策を記憶しており，印刷ジョブを実行中のプリンタに障害が発生する前に前記複数の障害対応策の中から障害対応策を予め選択しておくものである。

【００１０】更に，本発明の請求項３に係るプリントシステムは，請求項１記載のプリントシステムにおいて，前記プリンタ管理手段が，印刷を実行中の前記プリンタに障害が発生した場合，当該プリンタに対して印刷ジョブの廃棄命令を通知し，前記プリンタが，前記廃棄命令の通知を受信し，前記印刷ジョブを廃棄するものである。

【００１１】

【発明の実施の形態】以下，本発明に係るプリントシステム実施の形態を図面を参照しつつ詳細に説明する。

【００１２】図１は，本発明の実施の形態に係るプリントシステムの概略構成を示す構成図である。図１に示すプリントシステムは，印刷ジョブを実行中のプリンタに

障害が発生したことを検知し，予め定めた障害発生時の対応策に基づいてプリンタに代わる代理プリンタを選択すると共に，代理プリンタに対して印刷ジョブと障害が発生したプリンタが既に印刷を終了したページ情報とを送信する本発明のプリンタ管理手段としてのプリンタマネージャ１０１と，代理プリンタとして選択された場合，プリンタマネージャ１０１から印刷ジョブとページ情報とを受信し，ページ情報に基づいて，既に実行された印刷ジョブの続きを実行する複数のプリンタ１０２，１０３と，を備え，プリンタマネージャ１０１と複数のプリンタ１０２，１０３とはネットワーク１００を介してそれぞれ接続されて構成されている。

【００１３】また，ネットワーク１００上には，ワープロ・データベース等のアプリケーションを備えた端末装置１０４，１０５が接続されており，本発明のプリントシステムで印刷処理される文書等はこれらの端末装置１０４，１０５で作成される。なお，端末装置及びプリンタの接続数は，図１に示す数に限定されるものではない。

【００１４】プリンタマネージャ１０１には，管理すべき複数のプリンタ１０２，１０３が予め登録されている。プリンタマネージャ１０１は，登録されたプリンタ１０２，１０３と通信し，各プリンタ１０２，１０３が現在どのような状態にあるのかを常に把握している。そしてプリンタマネージャ１０１は，各端末装置１０４，１０５から印刷ジョブを受け付け，これを適切なプリンタに分配すると共に，プリント中のプリンタに印刷を続行することができない障害が発生した場合，後述する障害回避処理を実行する。

【００１５】プリンタ１０２，１０３は，１つのプリンタマネージャ１０１によって管理されており，プリンタのセットアップ時にプリンタマネージャ１０１に登録される。登録後，プリンタ１０２，１０３は，電源が投入される毎にプリンタマネージャ１０１に電源が投入されたことを通知し，プリントサービスを提供できるようになる。なお，プリンタ１０２，１０３は，プリンタマネージャ１０１から紙，給排紙トレイ，両面，コピー部数等の設定を受け付け，その設定に従ってＰＤＬデータで定義される印刷内容（印刷データ）を紙等のメディアに印刷する。また，ＰＤＬデータが与えられるときに，プリンタ１０２，１０３に対して印刷開始頁を印刷終了頁を指定することができる。ここでＰＤＬデータとは，印刷内容（文字，画像）をＰａｇｅ　Ｄｅｓｃｒｉｐｔｉｏｎ　Ｌａｎｇｕａｇｅで定義したデータのことである。

【００１６】ユーザは端末装置１０４，１０５で印刷ジョブを作成し，プリンタマネージャ１０１に印刷ジョブを渡す。また，ユーザは，プリンタマネージャ１０１を介して印刷の進捗状況の調査，障害時の対応策の選択，印刷終了の通知のサービスを受けることができる。

【００１７】なお，上記印刷ジョブとは，上述したＰＤＬデータと印刷ジョブ設定の組み合わせである。ここに印刷ジョブ設定とは，プリンタの選択，紙や給排紙トレイの選択，両面印刷の設定，コピー部数の設定，障害発生時の代理プリンタの選択，障害発生時の対応策の選択等を定義するデータの集まりのことである。代理プリンタの選択は，プリンタを明示的に選択する形式と，任意のプリンタ群から代理装置を選択するアルゴリズムを記述する形式とがある。

【００１８】以下に，本発明の実施の形態に係るプリントシステムの動作を［プリンタマネージャの動作］と［プリンタの動作］に分けて詳細に説明する。

【００１９】［プリンタマネージャの動作］図２は，本発明の実施の形態に係るプリントシステムにおいて，プリンタマネージャ１０１のメインルーチンを示すフローチャートである。ユーザは端末装置１０４，１０５において，ワープロ，データベース等のアプリケーションを用いて文書を作成する。そして，その文書を印刷する場合にプリンタマネージャ１０１を起動して印刷ジョブ設定を行う。ここでは，（プリンタマネージャの通常の処理），（障害発生時のプリンタマネージャの処理）の順でプリンタマネージャ１０１の動作を説明する。

【００２０】（プリンタマネージャの通常の処理）まず，プリンタマネージャ１０１は，印刷ジョブ設定のメニューをユーザの端末装置１０４，１０５に表示する（Ｓ２０１）。ユーザは，このメニュー上でプリンタの選択，紙や給排紙トレイの選択，両面印刷の設定，コピー部数の設定，障害発生時の代理プリンタの選択，障害発生時の対応策を設定することができる。

【００２１】プリンタの選択においては，プリンタマネージャ１０１が管理する全てのプリンタがメニュー上に表示され，この中から明示的に特定のプリンタを１台又は複数台選択することができる。プリンタを１台だけ選択した場合は，そのプリンタのみが印刷に使用される。プリンタを複数台選択した場合は，印刷ジョブ設定で指定された条件を実現可能なプリンタの中で最適なプリンタがプリンタマネージャ１０１によって選択される。また，プリンタを明示的に選択しないことも可能であり，この場合はプリンタマネージャ１０１が管理する全てのプリンタであって，印刷ジョブ設定で指定された条件を実現可能なプリンタの中から最適なプリンタが選択される。

【００２２】また，プリンタマネージャ１０１は，障害発生時の対応策として「しない」，「直ちに代理プリンタに切り替える」，「障害発生後，Ｘ分以内に障害が解決されなかったら代理プリンタに切り替える」等の数種類の対応策を記憶しており，これらをメニュー上に表示する。ユーザは，印刷ジョブの重要度に合わせて障害発生時の対応策を選択することができる。

【００２３】紙，給排紙トレイ，両面印刷，コピー部数

の設定については，利用可能な複数のプリンタの機能の和のリストがメニュー上に表示されるため，この中から必要な機能が選択される。例えば３台のプリンタが利用可能である場合において（特定のプリンタが選択されていないか，３台が明示的に選択されている場合），２台が両面印刷が可能で１台が両面印刷できないとする。この場合は印刷ジョブ設定メニューで「両面印刷」を設定することができる。ただし，「両面印刷」を選択した時点で両面印刷できないプリンタは選択対象から除外される。

【００２４】代理プリンタは，印刷ジョブ設定で指定された条件を満たすプリンタの中から１台以上選択される。最初に選択されたプリンタでの印刷ジョブの実行に障害が発生しない限り，プリンタマネージャ１０１は代理プリンタに印刷ジョブを転送することはない。

【００２５】なお，本発明の実施の形態の説明においては，端末装置１０４から印刷要求があり，印刷ジョブの設定において，最初に印刷を実行するプリンタとしてプリンタ１０２が選択され，代理プリンタとしてプリンタ１０３が選択されたものとする。

【００２６】プリンタマネージャ１０１は，ステップＳ２０１において印刷ジョブ設定が完了すると，端末装置１０４からＰＤＬデータに変換された文書を受信する（Ｓ２０２）。プリンタマネージャ１０１は，印刷ジョブ設定とＰＤＬデータとを組み合わせ，印刷ジョブの終了まで責任を持って管理する。

【００２７】プリンタマネージャ１０１は，印刷ジョブ設定に基づいて，印刷ジョブを実行させるプリンタを選択する（Ｓ２０３）。上述したように，ユーザによって選択された特定の１台のプリンタ又は印刷ジョブ設定で指定された条件に適合する１台のプリンタが選択される。ここではプリンタ１０２が選択される。

【００２８】プリンタマネージャ１０１は，選択したプリンタ１０２が印刷ジョブを実行可能か否かを判断する（Ｓ２０４）。プリンタ１０２が印刷ジョブを実行可能な状態にあれば，プリンタ１０２に対してプリンタジョブ設定を送信し，プリンタ１０２にプリンタジョブ設定を行わせる（Ｓ２０７）。ここでプリンタジョブ設定とは，ステップＳ２０１で行った印刷ジョブ設定からプリンタの選択と代理プリンタの選択の設定を除いたものである。すなわち，プリンタジョブ設定は，紙や給排紙トレイの選択，両面印刷の設定，コピー部数の設定の集合である。

【００２９】一方，選択したプリンタ１０２が印刷ジョブを実行することができない状態にある場合は，プリンタ１０２がビジーであるか否かを判断する（Ｓ２０５）。ビジーである場合は，ステップＳ２０４に戻ってビジー状態が解消されるのを待つ。ビジーではなく，何らかの理由により印刷ジョブを実行不可能である場合は，別のプリンタを選択し（Ｓ２０６），ステップＳ２０４に戻って処理を続行する。

【００３０】続いてプリンタマネージャ１０１は，プリンタ１０２からプリンタジョブ設定終了の報告を受け（Ｓ２０８），プリンタ１０２に対しＰＤＬデータを転送する（Ｓ２０９）。

【００３１】そして，プリンタマネージャ１０１は，プリンタ１０２からの印刷終了通知を待つ（Ｓ２１０）。印刷終了通知を受信した場合は，管理しているＰＤＬデータを削除すると共に（Ｓ２１１），端末装置１０４に対してジョブ終了の通知を送信し（Ｓ２１２），ジョブを終了する。

【００３２】図３は，プリンタマネージャ１０１のイベント処理ルーチンを示すフローチャートである。プリンタマネージャは１０１は，図２のステップＳ２０９でＰＤＬデータをプリンタに送信してから印刷完了まで，プリンタから現在の状況に関する情報の通知（イベント）を受ける。

【００３３】プリンタマネージャ１０１は，イベントを受信すると，そのイベントがプリンタに障害が発生したことを示すもの（障害発生報告イベント）か否かを判断する（Ｓ３０１）。障害の発生でなければ，そのイベントがプリンタの印刷ジョブの進捗状況を示すもの（進捗状況報告イベント）か否かを判断する（Ｓ３０２）。

【００３４】進捗状況報告イベントとは，プリンタの動作を説明する際に詳細に説明するが，ＰＤＬデータの処理を開始し，紙を１枚排紙する度にプリンタから送信されるものであって，ＰＤＬデータで定義されたページの番号，プリンタジョブ設定で指定されたコピー部数等が記載されたものである。なお，両面印刷時には，印刷が終了したのが表か裏かの情報も同時に記載される。

【００３５】プリンタマネージャ１０１は，プリンタ１０２から送られた進捗状況を記録してプリンタ１０２が印刷を終了したページとコピー枚数を常に把握すると共に，この進捗状況を端末装置１０４の端末画面に表示する（Ｓ３０４）。例えば，「印刷終了枚数：Ｘ，；コピー終了枚数：Ｙ」と表示し，プリントジョブの全枚数とコピー部数とがわかっている場合は，予想終了時刻をも表示する。

【００３６】その後，プリンタマネージャ１０１は，プリンタ１０２から印刷完了の通知を受け（Ｓ３０５），端末装置１０４に印刷の完了を通知し（Ｓ３０６），イベント処理を終了する。

【００３７】なお，図３のステップＳ３０２において，受信したイベントが印刷ジョブ進捗状況ではない場合はその他のイベント処理を行う（Ｓ３０３）。その他のイベント処理は本発明とは直接関連性がないため，ここではその説明を省略する。

【００３８】（障害発生時のプリンタマネージャの処理）次に，プリンタ１０２に障害が発生した場合の動作を説明する。なお，障害とは，例えば紙詰まり，用紙切

れ等，プリンタが印刷を継続することができない全ての場合を含むものとする。

【００３９】図３のステップＳ３０１において，プリンタマネージャ１０１は，プリンタから送信されたイベントからプリンタに障害が発生したことを検知する。続いてプリンタマネージャ１０１は，印刷ジョブ設定で選択された障害発生時の対応策を確認する。例えば，障害発生時の対応策として「障害が発生したら直ちに代理プリンタに切り替えて継続する」が選択されている場合，ステップＳ３０８に進み，障害回避処理を開始することを決定する。また，例えば，障害発生時の対応策として「障害発生後，Ｘ分以内に障害が解決されなかったら代理プリンタに切り替える」が選択されている場合，ステップＳ３０７で障害回避タイマを起動させ，所定の時間，障害回避処理の開始を待つ。

【００４０】ステップＳ３０８において障害回避処理の開始を決定した後，プリンタマネージャ１０１は，障害が発生したプリンタ１０２にジョブ廃棄命令を通知し（Ｓ３０９），障害が解除された後に残りのデータが印刷されないようにする。

【００４１】図２に戻り，障害回避処理の続きを説明する。ステップＳ２１３において，プリンタマネージャ１０１は，印刷ジョブ設定に基づいて代理プリンタを決定する。ここではプリンタ１０３が代理プリンタとして使用される。

【００４２】プリンタマネージャ１０１は，決定した代理プリンタ１０３が印刷ジョブを実行可能か否かを判断する（Ｓ２１４）。代理プリンタ１０３が印刷ジョブを実行可能な状態にあれば，代理プリンタ１０３に対してプリンタジョブ設定を送信し，プリンタジョブ設定を行う（Ｓ２１７）。このプリンタジョブ設定とは，障害が発生したプリンタに送った設定に「ＰＤＬデータ読み飛ばしモード」を選択するフラッグと，障害が発生したプリンタが最後に転送して来た進捗状況報告イベントを追加したものである。なお，「ＰＤＬデータ読み飛ばしモード」とは，後述するプリンタの動作モードであって，障害が発生したプリンタが最後に転送して来た進捗情報報告イベントを参照し，既に印刷されたページの印刷処理を行わないようにするモードである。また，代理プリンタ１０３が選択されたことは，端末装置１０４の表示画面に表示される。

【００４３】一方，ステップＳ２１４において，決定した代理プリンタ１０３が印刷ジョブを実行することができない状態にある場合は，その代理プリンタ１０３がビジーであるか否かを判断する（Ｓ２１５）。ビジーである場合は，ステップＳ２１４に戻ってビジー状態が解消されるのを待つ。ビジーではなく，何らかの理由により印刷ジョブを実行不可能である場合は，別のプリンタを選択し（Ｓ２１６），ステップＳ２１４に戻って処理を続行する。

【００４４】続いてプリンタマネージャ１０１は，代理プリンタ１０３からプリンタジョブ設定完了の報告を受け（Ｓ２１８），代理プリンタに対しＰＤＬデータを転送する（Ｓ２０９）。なお，ＰＤＬデータ転送後の処理は，前述した（プリンタマネージャの通常の処理）の項で説明した通りであるため，ここではその説明を省略する。

【００４５】［プリンタの動作］続いてプリンタの動作を（通常の処理），（障害発生時の処理）及び（代理プリンタの動作）に分けて説明する。図４は，本発明の実施の形態に係るプリントシステムにおいて，プリンタのメインルーチンを示すフローチャートである。

【００４６】（通常の処理）印刷ジョブ設定で選択されたプリンタ１０２は，プリンタマネージャ１０１から送信されたプリンタジョブ設定を受信し，自身の設定を変更する（Ｓ４０１）。

【００４７】プリンタ１０２は，プリンタジョブ設定に「ＰＤＬデータ読み飛ばしモード」のフラッグが存在するか否かを判断する（Ｓ４０２）。ここでは「ＰＤＬデータ読み飛ばしモード」のフラッグが存在しないものとしてステップＳ４０４に進み，プリンタマネージャ１０１に対しプリンタジョブ設定終了の報告を送信する。

【００４８】そして，プリンタマネージャ１０１から送信されたＰＤＬデータを受信し，ＰＤＬデータをページ毎に処理する（Ｓ４０５）。まず，ＰＤＬデータに基づいてページイメージを作成し（Ｓ４０６），記録紙に印刷する（Ｓ４０８）。印刷された記録紙が排紙されたことを検知すると（Ｓ４０９），進捗状況報告イベントをプリンタマネージャ１０１に対して送信する（Ｓ４１０）。すなわち，進捗情報報告イベントは，紙を１枚排紙する毎にプリンタマネージャ１０１に対して出力される。

【００４９】ここで，進捗状況報告イベントを詳細に説明する。進捗状況報告イベントは，Ｐｎ－Ｃｎ－Ｓｎ－Ｆｎ－Ｔｎという形式で表記される。ここでＰｎはＰＤＬデータで定義されるページの番号であり，Ｃｎはコピー部数番号である。Ｓｎは印刷される紙の番号であり，ページ番号やコピー部数に関係なくプリンタが操作する順番に紙に連番が付けられる。Ｆｎは紙の面の番号であり，例えば０が表で１が裏を表示する。Ｔｎは排紙トレイの番号である。

【００５０】ＰＤＬデータは，プリントするデータを１ページ目から順番に定義するものである。つまりｎページ分のデータは，Ｐ１，Ｐ２，Ｐ３，・・・，Ｐｎと並んでおり，これらのページはこの順番で紙Ｓ１，Ｓ２，Ｓ３，・・・，Ｓｎに印刷されていく。なお，両面印刷の場合はＰ１がＳ１の表に印刷され，Ｐ２がＳ１の裏にそれぞれ印刷される。よって，進捗状況報告イベントは具体的に，

Ｐ１－Ｃ１－Ｓ１－Ｆ１－Ｔ１，

Ｐ２－Ｃ１－Ｓ２－Ｆ１－Ｔ１，
Ｐ３－Ｃ１－Ｓ３－Ｆ１－Ｔ１，
・・・・・・・・・・・・・・・，
Ｐｎ－Ｃ１－Ｓｎ－Ｆ１－Ｔ１
と表記される。

【００５１】また，プリントジョブ設定にｍ部のコピー部数が指定されている場合（自動的にソータが使用される）であり，かつ片面印刷の場合，Ｐ１－１，Ｐ１－２，Ｐ１－３，・・・Ｐｎ－ｍ，Ｐ２－１，Ｐ２－２，Ｐ２－３，・・・，Ｐｎ－ｍというページデータがＳ１，Ｓ２，Ｓ３，・・・，Ｓｎｘｍの紙に印刷される。したがって進捗情報報告イベントは，
Ｐ１－Ｃ１－Ｓ１－Ｆ１－Ｔ１，
Ｐ１－Ｃ２－Ｓ２－Ｆ１－Ｔ２，
・・・・・・・・・・・・・・・，
Ｐ１－Ｃｍ－Ｓｍ－Ｆ１－Ｔｍ，
Ｐ２－Ｃ１－Ｓ（ｍ＋１）－Ｆ１－Ｔ１，
Ｐ２－Ｃ（ｍ＋２）－Ｓ１－Ｆ１－Ｔ２，
・・・・・・・・・・・・・・・，
Ｐ１－Ｃｍ－Ｓ（２ｍ）－Ｆ１－Ｔｍ，
と表記される。

【００５２】両面印刷の場合，Ｐ１－１とＰ２－１とがＳ１，Ｐ１－２とＰ２－２とがＳ２，・・・Ｐ（ｎ－１）－ｍとＰｎ－ｍ（ｎが偶数の場合）又はＰｎ－１（ｎが奇数の場合）のページデータがＳｎｍに印刷される。したがって，進捗状況報告イベントは，
Ｐ１－Ｃ１－Ｓ１－Ｆ１－Ｔ１，
Ｐ２－Ｃ１－Ｓ１－Ｆ２－Ｔ１，
Ｐ１－Ｃ２－Ｓ２－Ｆ１－Ｔ２，
Ｐ２－Ｃ２－Ｓ２－Ｆ２－Ｔ２，
・・・・・・・・・・・・・・・
と表記される。

【００５３】つまりプリンタは，紙が１枚排紙される度に「ＰＤＬのｐページ目のデータのｃ番目のコピーをｓ番目の紙に印刷して，ｔ番の排紙トレイに排紙した」又は「ＰＤＬのｐページ目とｐ＋１ページ目のデータのｃ番目のコピーをｓ番目の紙に印刷して，ｔ番の排紙トレイに排紙した」ということをプリンタマネージャ１０１に対して報告する。ただし，上記進捗状況報告イベントの表記方法はあくまで例であって，表記方法はプリンタのメカニズム，例えば両面印刷の方法によって変化するものである。

【００５４】プリンタ１０２は，進捗状況報告イベントの通知を行った後，ＰＤＬデータが終了であるか否かを判断する（Ｓ４１１）。ＰＤＬデータが終了していない場合は，ステップＳ４０５に戻って上述した処理を実行する。一方，ＰＤＬデータが終了した場合は，プリンタマネージャ１０１に対してジョブ終了通知を送信し（Ｓ４１２），印刷ジョブを終了する。

【００５５】（障害発生時の処理）次に，プリンタに紙詰まりが発生したものとして障害発生時のプリンタの動作を説明する。プリンタ１０２は，紙詰まりが発生したことを検知すると，障害発生報告イベントを送信し，プリンタマネージャ１０１に対して障害が発生したことを通知する（Ｓ４１３）。

【００５６】その後，障害が解除された場合はステップＳ４０８に進み，印刷を継続する（Ｓ４１４）。一方，障害が解除されない場合はプリンタマネージャ１０１からの印刷ジョブ廃棄命令を待つ（Ｓ４１５）。印刷ジョブ廃棄命令を受信した場合，プリンタ１０２は障害によって中断された印刷ジョブを破棄すると共に，印刷ジョブを廃棄した旨をプリンタマネージャ１０１に通知し（Ｓ４１６），ジョブを終了する。

【００５７】（代理プリンタの動作）上述したように，印刷ジョブを実行中のプリンタ１０２に障害が発生した場合，プリンタマネージャ１０１は予め設定した印刷ジョブ設定に従って代理プリンタを決定する。代理プリンタに決定されたプリンタ１０３は，プリンタマネージャ１０１から送信されたプリンタジョブ設定を受信し，自身の設定を変更する（Ｓ４０１）。なお，このプリンタジョブ設定には，障害が発生したプリンタ１０２に対して送った設定に加え，「ＰＤＬデータ読み飛ばしモード」を選択するフラッグと，障害が発生したプリンタ１０２が最後に送信してきた進捗状況報告イベントとが追加されたされたものである。

【００５８】代理プリンタ１０３は，プリンタジョブ設定から「ＰＤＬデータ読み飛ばしモード」を選択するフラッグを検知すると（Ｓ４０２），プリンタジョブ設定に設定された進捗状況報告イベントに従い読み飛ばしページ番号を設定する（Ｓ４０３）。すなわち，読み飛ばしページ番号を設定することにより，障害が発生したプリンタ１０２が既に印刷したページの印刷処理を実行しないようにする。その後，代理プリンタ１０３は，プリンタマネージャ１０１に対して設定が完了した旨を通知する（Ｓ４０４）。

【００５９】続いて，プリンタマネージャ１０１から送信されたＰＤＬデータを受信し，ＰＤＬデータをページ毎に処理する（Ｓ４０５）。まず，ＰＤＬデータに基づいてページイメージを作成する（Ｓ４０６）。続いてページイメージを作成したページと設定した読み飛ばしページ番号とを比較する（Ｓ４０７）。例えば，作成したページイメージがＰＤＬデータの１ページ目で，読み飛ばしページ番号が３ページと設定されている場合，作成したページイメージは既に障害が発生したプリンタ１０２で印刷が終了しているため，記録紙へは印刷せず，ステップＳ４１０に進んで進捗状況報告を行う。

【００６０】一方，例えば作成したページイメージがＰＤＬデータの４ページ目で，読み飛ばしページ番号が３ページと設定されている場合，作成したページイメージはまだ印刷されていないため，記録紙へ印刷し（Ｓ４０

8），記録紙を排紙した後（Ｓ４０９），進捗状況報告を行う（Ｓ４１０）。代理プリンタ１０３の動作において，障害が発生した場合の動作を含むその他の動作については，（通常の処理）及び（障害発生時の処理）で説明したものと同様であるのでその説明を省略する。

【００６１】なお，障害が発生したプリンタ１０２と代理プリンタ１０３とが同じ機種である場合，代理プリンタ１０３は障害が発生したプリンタ１０２と同様の処理を行うことができるため，排紙トレイの選択，表・裏の印刷処理等も問題なく行うことができる。

【００６２】一方，障害が発生したプリンタ１０２と代理プリンタ１０３とが異なる機種である場合であって，プリントジョブ設定として両面印刷でコピー部数が複数に設定されている場合は，プリンタによって印刷する順序が異なることがある。この場合，代理プリンタ１０３は，「障害が発生したプリンタが印刷を終了した紙」を印刷しないのではなく，「障害が発生したプリンタが処理を完全に終了した偶数ページ分のＰＤＬデータ」を印刷しないという処理を行うことにより，プリンタの印刷機構が異なっていても，途中の数ページが印刷されないということを避けることができる。

【００６３】このように本発明の実施の形態に係るプリントシステムによれば，印刷ジョブを実行中のプリンタ１０２に障害が発生した場合，それまでに印刷が終了した分を無駄にせず，残りを別の代理プリンタ１０３で印刷することによって，人間の介在なしで印刷ジョブを終了可能にすることができる。また，障害発生時の対応策は，「しない」，「直ちに代理プリンタに切り替える」，「障害発生後，Ｘ分以内に障害が解決されなかったら代理プリンタに切り替える」等の数種類の中から選択することができるため，印刷ジョブの重要度に合わせて障害発生時の対応策を選択することができ，非常に便利である。

【００６４】

【発明の効果】以上説明したように，本発明に係るプリントシステム（請求項１）によれば，印刷ジョブを実行中のプリンタに障害が発生したことを検知し，予め定めた障害発生時の対応策に基づいてプリンタに代わる代理プリンタを選択すると共に，代理プリンタに対して印刷ジョブと障害が発生したプリンタが既に印刷を終了したページ情報とを送信するプリンタ管理手段と，代理プリンタとして選択された場合，プリンタ管理手段から印刷ジョブとページ情報とを受信し，ページ情報に基づいて，既に実行された印刷ジョブの続きを実行するプリンタと，を備えているため，障害が発生したプリンタで既に印刷が終了した分を無駄にすることなく，代理プリンタで印刷ジョブを完了することができる。

【００６５】また，本発明に係るプリントシステム（請求項２）によれば，請求項１記載のプリントシステムにおいて，プリンタ管理手段が，複数の障害対応策を記憶しており，印刷ジョブを実行中のプリンタに障害が発生する前に複数の障害対応策の中から障害対応策を予め選択しておくことにしたため，障害回避の方針を任意に変更することが可能となる。

【００６６】更に，本発明に係るプリントシステム（請求項３）によれば，請求項１記載のプリントシステムにおいて，プリンタ管理手段が，印刷を実行中のプリンタに障害が発生した場合，当該プリンタに対して印刷ジョブの廃棄命令を通知し，プリンタが，廃棄命令の通知を受信し，印刷ジョブを廃棄することにしたため，代理プリンタに残りの印刷ジョブを続行させたにも拘らず，障害が発生したプリンタの障害が解除された後に同一データが印刷されるということを防止することができる。

【図面の簡単な説明】

【図１】本発明の実施の形態に係るプリントシステムの概略構成を示す構成図である。

【図２】本発明の実施の形態に係るプリントシステムにおいて，プリンタマネージャのメインルーチンを示すフローチャートである。

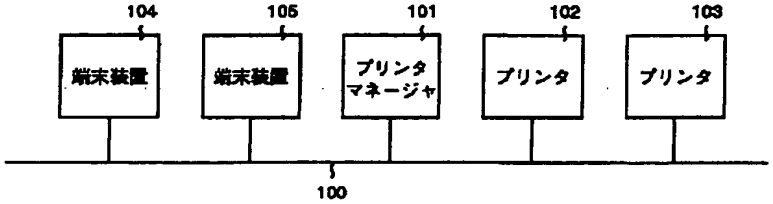
【図３】本発明の実施の形態に係るプリントシステムにおいて，プリンタマネージャのイベント処理ルーチンを示すフローチャートである。

【図４】本発明の実施の形態に係るプリントシステムにおいて，プリンタのメインルーチンを示すフローチャートである。

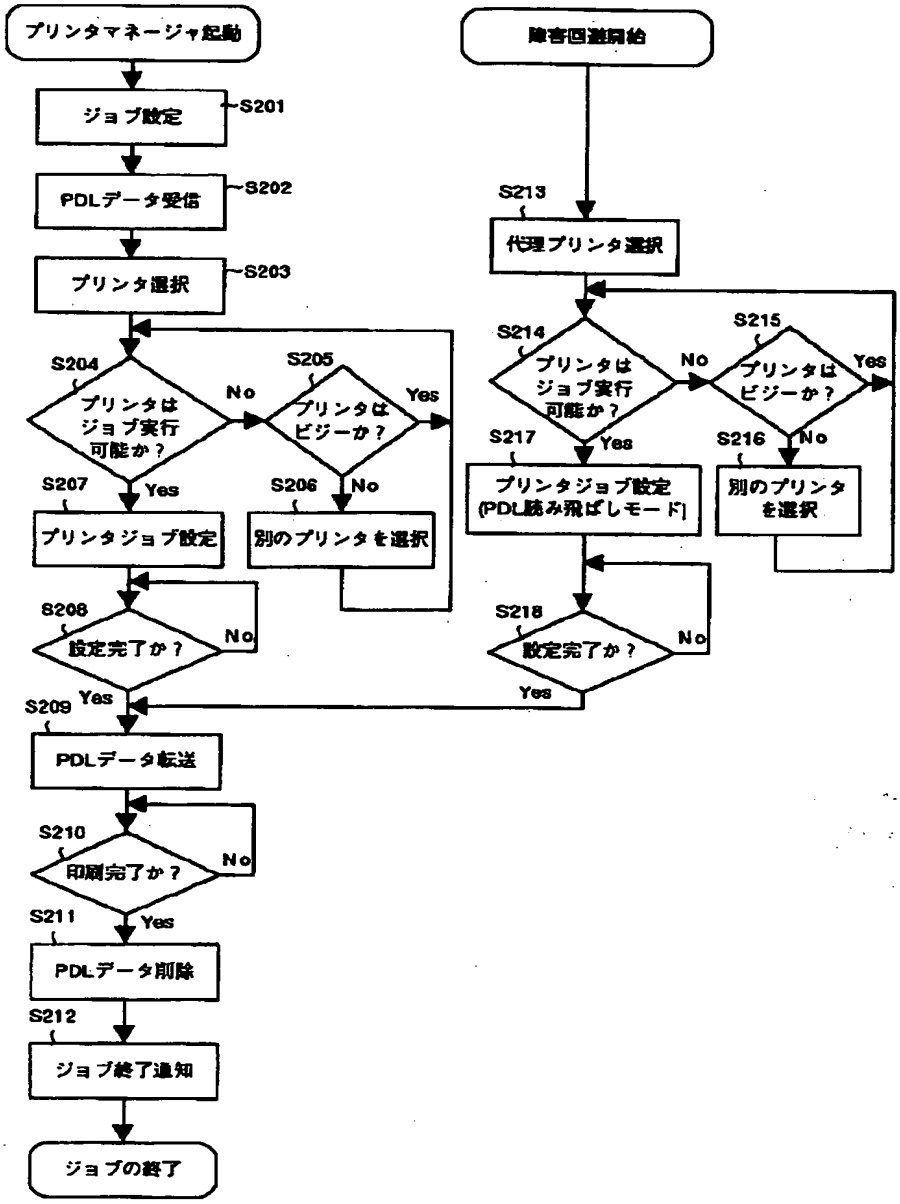
【符号の説明】

１００　ネットワーク
１０１　プリンタマネージャ
１０２，１０３　プリンタ
１０４，１０５　端末装置

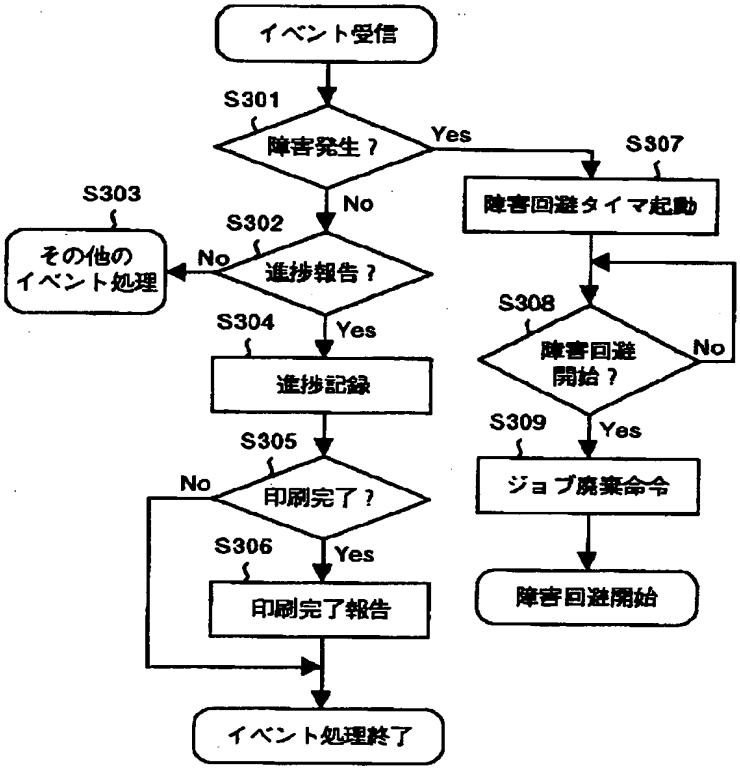
【図１】



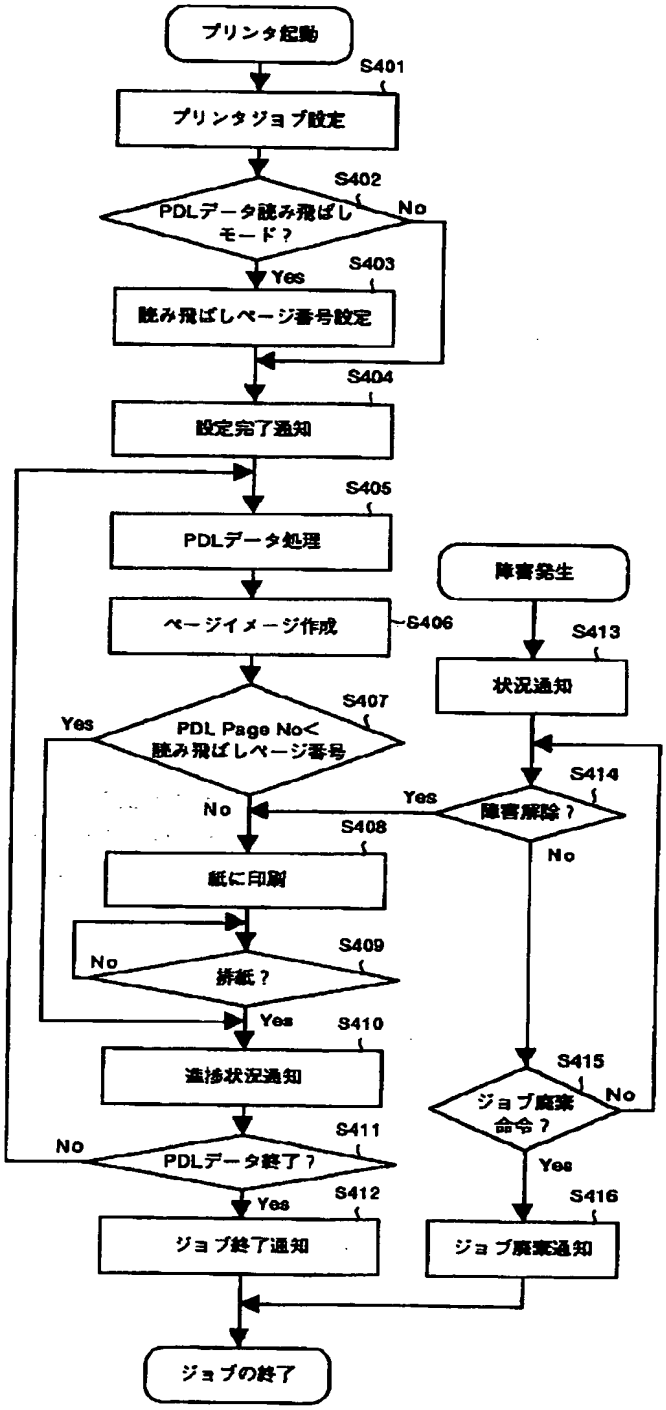
【図２】


プリンタマネージャ起動
ジョブ設定
S201
PDLデータ受信
S202
プリンタ選択
S203
S204
プリンタはジョブ実行可能か？
No
S205
プリンタはビジーか？
Yes
S207
Yes
プリンタジョブ設定
S206
No
別のプリンタを選択
S208
設定完了か？
No
Yes
S209
PDLデータ転送
S210
印刷完了か？
No
S211
Yes
PDLデータ削除
S212
ジョブ終了通知
ジョブの終了
障害回避開始
S213
代理プリンタ選択
S214
プリンタはジョブ実行可能か？
No
S215
プリンタはビジーか？
Yes
S217
Yes
プリンタジョブ設定(PDL読み飛ばしモード)
S216
No
別のプリンタを選択
S218
設定完了か？
No
Yes

【図３】


イベント受信
S301
障害発生？
Yes
S307
障害回避タイマ起動
No
S303
その他の
イベント処理
S302
No
進捗報告？
S308
障害回避
開始？
No
S304
Yes
進捗記録
S309
Yes
S305
ジョブ廃棄命令
No
印刷完了？
S306
Yes
印刷完了報告
障害回避開始
イベント処理終了

【図４】


プリンタ起動
S401
プリンタジョブ設定
S402
PDLデータ読み飛ばし
モード？
No
Yes
S403
読み飛ばしページ番号設定
S404
設定完了通知
S405
PDLデータ処理
S406
ページイメージ作成
S407
PDL Page No<
読み飛ばしページ番号
Yes
No
S408
紙に印刷
S409
排紙？
No
Yes
S410
進捗状況通知
S411
PDLデータ終了？
No
Yes
S412
ジョブ終了通知
ジョブの終了
障害発生
S413
状況通知
S414
障害解除？
Yes
No
S415
ジョブ廃棄
命令？
No
Yes
S416
ジョブ廃棄通知